REMARKS

Claims 1-20 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Applicants respectfully traverse the rejection of Claims 1 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Paul et al. (U.S. Pat. No. 5,332,927) in view of Chalasani et al. (U.S. Pat. No. 6,037,747).

Referring to Claim 1, Paul et al. do not show, teach, or suggest a contactor that connects batteries to a load, as admitted by the Examiner. **Second Office Action, p. 2 (June 10, 2003).** Paul et al. also do not show, teach, or suggest a controller that opens the contactor when a voltage of the batteries falls below a low voltage disconnect threshold and closes the contactor after an AC source returns while minimizing voltage transients and current surge during reconnection, as admitted by Examiner. **Second Office Action at 2.**

Chalasani et al. do not show, teach, or suggest a controller that opens a contactor that connects batteries to a load when a voltage of the batteries falls below a low voltage disconnect threshold and that closes the contactor after an AC source returns while minimizing voltage transients and current surge during reconnection.

Chalasani et al. teach an intermittent charging system for a battery back-up power supply. During normal operation, a battery is disconnected from a load and an AC/DC rectifier (col. 5, line 60). While disconnected, the battery self-discharges. A

temperature transducer senses a temperature of the battery. The battery is reconnected to the AC/DC rectifier only when the temperature of the battery is below a predetermined temperature (col. 5, line 44).

When a power source fails and a voltage of the AC/DC rectifier falls below a predetermined voltage, Chalasani et al. teach reconnecting the battery to the load (col. 5, line 62). While the voltage of the AC/DC rectifier remains below the predetermined voltage, the battery is disconnected from the load when the battery "almost completely discharges" to avoid putting the battery in a deep discharge (col. 5, line 33).

The battery is not reconnected to the load when the power source returns as required by the claims. The battery is reconnected to the AC/DC rectifier only when the temperature of the battery is below the predetermined temperature (col. 5, line 51). Furthermore, voltage transients and current surge are not minimized during reconnection as required by the claims. For example, Chalasani et al. do not teach first lowering a voltage of the AC/DC rectifier to a discharged voltage of the battery before connecting the battery to the AC/DC rectifier as taught by Applicants. Therefore, Chalasani et al. fail to remedy the shortcomings of Paul et al.

Claims 2-10 depend directly or indirectly from Claim 1 and are allowable over Paul et al. and Chalasani et al. for the same reasons.

Referring to Claim 11, Paul et al. do not show, teach, or suggest using a contactor to connect batteries to a load, as admitted by the Examiner. **Second Office Action at 3**. Paul et al. also do not show teach or suggest monitoring voltage that is output by the batteries with a controller, disconnecting batteries from a load using the controller when the voltage falls below a low voltage disconnect threshold, and

minimizing voltage transients and current surge when reconnecting the batteries to the load using the controller, as admitted by the Examiner. **Second Office Action at 3**.

Chalasani et al. do not show, teach, or suggest minimizing voltage transients and current surge when reconnecting batteries to a load using a controller.

Chalasani et al. disconnect a battery from a load and an AC/DC rectifier during normal operation. The battery is reconnected to the AC/DC rectifier only when the temperature of the battery is below a predetermined temperature. Chalasani et al. reconnect the battery to the load when a power source fails and a voltage of the AC/DC rectifier falls below a predetermined voltage. The battery is disconnected from the load when the battery "almost completely discharges" to avoid putting the battery in a deep discharge.

Chalasani et al. do not minimize voltage transients and current surge when reconnecting the battery to the load, as required the claims. Chalasani et al. reconnect the battery to the AC/DC rectifier only when the temperature of the battery is below the predetermined temperature.

On page 3, line 1, Applicants teach that if the back-up batteries are reconnected by closing the contactor, sharp voltage transients and high in-rush current occurs which may damage the batteries and the contactor and disrupt the operation of the loads. For example, Applicants teach first lowering a voltage of the AC/DC rectifier to a discharged voltage of the battery before reconnecting the battery to the rectifier module. Then, Applicants teach gradually increasing the voltage of the AC/DC rectifier to a float voltage of the battery.

Chalasani et al. permit recharging of a battery only during specified times. For example, as in Figure 4, Chalasani et al. propose charging the battery only during night hours. While a temperature of the battery is above a predetermined temperature, the battery is not charged. Therefore, the battery may remain unavailable for a long time. For example, if the battery is "almost completely discharged" early in the day, the opportunity to recharge the battery may not exist until the night. Therefore, Chalasani et al. fail to remedy the shortcomings of Paul et al.

Claims 12 and 13 depend directly or indirectly from Claim 11 and are allowable over Paul et al. and Chalasani et al. for the same reasons.

Applicants respectfully traverse the rejection of Claim 14 under 35 U.S.C. § 103(a) as being unpatentable over Paul et al. (U.S. Pat. No. 5,332,927) in view of Chalasani et al. (U.S. Pat. No. 6,037,747) and Farmer (U.S. Pat. No. 5,642,100).

Paul et al. do not show, teach, or suggest a contactor that connects a battery module to a power bus. Paul et al. teach backup batteries that have a common connection with a load, a rectifier, and an auxiliary power system. A contactor does not connect the backup batteries to any of the other components.

Paul et al. do not show, teach, or suggest a plurality of rectifier modules that are connected to a power bus and to a plurality of alternating current (AC) power sources, as admitted by the Examiner. **Second Office Action at 6.** Paul et al. also do not show, teach, or suggest a controller that disconnects a battery module using a contactor when a voltage of the battery module falls below a low voltage disconnect when the rectifier modules fail to provide power, wherein the controller minimizes current surge and high voltage transients when the rectifier modules begin to provide power and the controller

reconnects the battery module to a load, as admitted by the Examiner. **Second Office Action at 6.**

Chalasani et al. do not show, teach, or suggest a controller that disconnects a battery module using a contactor when a voltage of the battery module falls below a low voltage disconnect when rectifier modules fail to provide power, wherein the controller minimizes current surge and high voltage transients when the rectifier modules begin to provide power and the controller reconnects the battery module to a load.

As discussed above, Chalasani et al. teach an intermittent charging system for a battery back-up power supply. A battery is connected to an AC/DC rectifier for charging only when a temperature of the battery is below a predetermined temperature. The battery is connected to the load when a power source fails and a voltage of the AC/DC rectifier falls below a predetermined voltage. The battery is disconnected from the load when the battery "almost completely discharges" to avoid putting the battery in a deep discharge. The battery is not reconnected to the load when the power source returns. The battery is reconnected to the AC/DC rectifier only when the temperature of the battery is below the predetermined temperature.

Farmer does not remedy the shortcomings of either Paul et al. or Chalasani et al. Farmer teaches a battery that is connected to a rectifier and a load. A disconnect switch interrupts the current to the system when the current supplied by the rectifier exceeds the current received by the load by a predetermined value. The disconnect switch does not interrupt the current flow to the battery when the battery falls below a voltage threshold. The disconnect switch also does not interrupt the current flow to the battery when the rectifier fails to provide power.

Claims 15-20 depend directly or indirectly from Claim 14 and are allowable over Paul et al., Chalasani et al., and Farmer for the same reasons.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: 9/10/03

By: Michael D. Wiggins
Michael D. Wiggins
Reg. No. 34,754

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

MDW/lkj